quality of a food material. The practice is also used in the automotive industry to test some physico-chemical properties of polymeric materials such as dashboard and their potential impact on the consumer. See Zhang, L. et al., "Sensory evaluation of commercial truck interiors", SAE Technical Paper Series, 1999-01-1267, as referenced on attached form PTO 1449. No new matter has been entered.

The previously present claims were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,469,369 to Rose-Pehrsson et al. or as obvious in view of Rose-Pehrsson et al. in combination with U.S. Patent No. 5,911,872 to Lewis et al., U.S. Patent No. 5,244,813 to Walt et al. U.S. Patent No. 5,552,272 to Bogart, U.S. Patent No. 5,406,829 to Ravel et al. or U.S. Patent No. 5,736,782 to Schairer. Applicant submits that the teachings of these references do not disclose or suggest the invention defined by the present claims.

Rose-Pehrsson et al. disclose a method and system of identifying if an unknown vapor is within a known class of vapors by introducing a sample of the unknown vapor into at least one sensor coated with a vapor-sensitive coating. An N-space weight vector corresponding to a N-space representation of a class is generated of the unknown vapor. An N-space representative of the unknown vapor is generated. A dot product of the unknown pattern vector and the weight vector is calculated to determine if the vapor is within the class.

In contrast to the invention defined by the present claims, Rose-Pehrsson et al. do not teach or suggest a method for making or monitoring an electronic device. To the contrary, Rose-Pehrsson et al. teach a method for detecting of chemical warfare agents and other vapors. There is no teaching or suggestion that the method can be used for making or monitoring an electronic device. Although, Rose-Pehrsson et al. disclose that sensors can be located on a circuit board (col. 12, lines 9-11), Rose-Pehrsson et al. do not teach or suggest that the method is used for monitoring an electronic device in which an analyte is selected from a material in the electronic device, a constituent of the material, a byproduct of the material, a reaction product of a constituent of the material, a contaminant, and a tag. In addition, Rose-Pehrsson et al. do not teach or suggest detecting more than one physical, chemical, or physico-chemical property of the analyte, combining the detected properties to produce a signal output and processing the signal output by multivariate analysis. Rather, Rose-Pehrsson et al. disclose analyzing a single property of the vapor to determine whether a type of vapor is present. Furthermore, Rose-Pehrsson et al. art is specifically described as a technique for detecting chemical warfare agents, to be discriminated from other vapors or substances at higher concentrations in varying relative humidity, see col. 2, lines 45-50. First, Rose-Pehrsson et al. do not teach how to monitor an electronic device or materials. Second, Rose-Pehrsson et al. implies a limited and controlled ratio of concentrations between the chemical agent to be detected and its environmental background. The present invention does not use limitations in concentration or moisture level to detect an analyte comprising an electronic device materials, as defined in the present invention. Rose-Pehrsson et al. describe an embodiment that requires the use of a preconcentrator tube 28, see col. 5, line 49, to be able to detect CW agents. In contrast, the present invention detects analytes without the use of any preconcentrator. In col. 9, lines 56-60, Rose-Pehrsson et al. describe a prototype to detect only nerve and blister CW agents that mandate that sensor coatings be selected for both these applications in a pre-determined array configuration. Furthermore, in col. 10, lines 35 and thereof, Rose-Pehrsson et al. specifically describe families of coating materials that cannot be used for the described applications or that could provide very poor signals that do not provide useful information in detecting electronic devices or materials as defined in the present invention. The present invention can accommodate such coatings and provide relevant information about electronic device monitoring. Although Rose-Pehrsson et al. claims real-time signal analysis, this is discriminated from real-time signal acquisition and kinetics information. Accordingly, the invention defined by the present claims is not anticipated or obvious in view of Rose-Pehrsson et al.

Bogart teaches detection of an analyte by fluorescence using a thin film optical device. When an analyte is present on the surface of a substrate, the substrate exhibits a second color. The analyte is selected from the group consisting of rheumatoid factor; IgE antibodies specific for Birch pollen; carcinoembryonic antigen; streptococcus Group A antigen; viral antigens; antigens associated with autoimmune disease, allergens, a tumor or an infectious microorganism; streptococcus Group B antigen, HIV I or HIV II antigen;

or host response (antibodies) to said virus; antigens specific to RSV or host response (antibodies) to the virus; an antibody; antigen; enzyme; hormone; polysaccharide; protein; lipid; carbohydrate; drug or nucleic acid; is derived from the causative organisms for meningitis; Neisseria meningitides groups A, B, C, Y and W_{135}, Streptococcus pneumoniae, E. coli K1, Haemophilus influenza type B; an antigen derived from microorganisms; a hapten, a drug of abuse (including drugs which are unlawful to use without a permit or license); a therapeutic drug; an environmental agents; and antigens specific to Hepatitis.

In contrast to the invention defined by the present claims, Bogart does not teach or suggest a method for making or monitoring an electronic device in which an analyte is a gas, vapor, suspension in a gas or volatile organic compound. Rather, the analyte taught in Bogart is a solid pharmaceutical or biological component. There is no teaching or suggestion in Bogart that the analyte can be a gas, vapor, suspension in a gas or volatile organic compound. Further, Bogart does not teach or suggest detecting more than one physical, chemical, or physico-chemical property of the analyte combining the detected properties to produce a signal output and processing the signal output by multivariate analysis. Rather, only a fluorescence property of the analyte is detected. Accordingly, Bogart does not cure the deficiencies of Rose-Pehrsson et al. noted above.

Ravel et al. teach a temperature control system for acoustic wave chemical sensors in a common temperature environment, a fluid containing an analyte chemical to be measured flowing across one of the sensors as a test sensor, the other sensor being a reference sensor isolated from the fluid flow, each sensor providing a frequency signal as an output; means for determining a difference in frequency between the outputs of the sensors, the difference in frequency being a measure of the amount of the analyte chemical in the fluid. A heater control signal is generated in a feedback loop as a function of the frequency signal from the reference sensor.

In contrast to the invention defined by the present claims, Ravel et al. do not teach or suggest a method for making or monitoring an electronic device in which an analyte is a gas, vapor, suspension in a gas or volatile organic compound. Rather, Ravel et al. relates to a chemical sensor for a fluid. Further, Ravel et al. do not teach or suggest detecting more than one physical, chemical, or physico-chemical property of the analyte combining the detected properties to produce a signal output and processing the signal output by multivariate analysis. Accordingly, Ravel et al. do not cure the deficiencies of Rose-Pehrsson et al. noted above.

Lewis et al. describe sensors for detecting analyte in fluids. The resistor comprises a plurality of alternating nonconductive regions (comprising a nonconductive organic polymer) and conductive regions (comprising a conductive material) transverse to the electrical path. The resistor provides a difference in resistance between the conductive elements when contacted with a fluid comprising a chemical analyte at a first concentration, than when contacted with a fluid comprising the chemical analyte at a second different concentration. Arrays of such sensors are constructed with at least two sensors having different chemically sensitive resistors providing dissimilar such differences in resistance.

Lewis et al. do not teach or suggest a method for making or monitoring an electronic device in which an analyte is a gas, vapor, suspension in a gas or volatile organic compound. In addition, Lewis et al. do not teach or suggest detecting more than one physical, chemical, or physico-chemical property of the analyte combining the detected properties to produce a signal output and processing the signal output by multivariate analysis. Accordingly, Lewis et al. do not cure the deficiencies of Rose-Pehrsson et al. noted above.

Walt et al. disclose fiber optic sensors for detection of organic analytes. The sensor requires an optical fiber strand; an immobilized polarity-sensitive dye; and an immobilized polymeric material which not only contains the polarity-sensitive dye but also absorbs and partitions the organic analyte of interest.

In contrast to the invention defined by the present claims, Walt et al. do not teach or suggest a method for making or monitoring an electronic device in which an analyte is a gas, vapor, suspension in a gas or volatile organic compound. Further, Walt et al. do not teach or suggest detecting more than one physical, chemical, or physico-chemical property of the analyte combining the detected properties to produce a signal output and processing the signal output by multivariate analysis. Thus, Walt et al. do not cure the deficiencies of Rose-Pehrsson et al. noted above.

Schairer discloses a chip card with an integrated IR transceiver. Internal contact elements of the card can be implemented together with a soldering process.

In contrast to the invention defined by the present claims, Schairer does not teach or suggest a method for making or monitoring an electronic device in which an analyte is a gas, vapor, suspension in a gas or volatile organic compound. Also, Schairer does not teach or suggest detecting more than one physical, chemical, or physico-chemical property of the analyte combining the detected properties to produce a signal output and processing the signal output by multivariate analysis. Accordingly, Schairer does not cure the deficiencies of Rose-Pehrsson et al. noted above.

In view of the foregoing, Applicant submits that all pending claims are in condition for allowance and request that all claims be allowed. The Examiner is invited to contact the undersigned should she believe that this would expedite prosecution of this application. The Commissioner is authorized to charge a fee in the amount of $460.00 for a 3-month extension of time. The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,

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MARKED-UP COPY OF AMENDED CLAIMS

1. (Amended) A method for making or monitoring an electronic device, comprising the steps of:

measuring [an] at least one analyte selected from the group consisting of a material in the electronic device, a constituent of the material, a byproduct of the material, a reaction product of a constituent of the material, a contaminant, and a tag; the analyte is a gas, vapor, suspension in a gas or volatile organic compound;

detecting more than one physical, chemical, or physico-chemical property of the analyte;

combining the detected properties to produce a signal output; and

processing the signal output with multivariate analysis to convert the signal output into information representative of a quality of the material, a constituent of the material, or a variable in processing the material.

6. (Amended) A method according to claim 1 wherein the [quality analysis] processing step comprises sensory evaluation of the sample materials by human paneling to determine the quality of the material.

7. (Amended) A method according to claim 1 wherein in the step of measuring an analyte uses a near-field probe which comprises a coated optical fiber is used [in] for measuring the at least one analyte.

9. (Amended) A method according to claim 1, wherein a mixture of the analytes is screened, and the signal output represents the overall properties of the mixture.

10. (Amended) A method according to claim [8 comprising collecting gases] 1 wherein in the measuring step the at least one analyte is collected by a static or dynamic headspace technique.

11. (Amended) A method according to claim 10, wherein at least one member of the group consisting of heat, electromagnetic radiation, electricity, magnetism, and mechanical vibration [at least] assists in transferring the at least one analyte from the

material to [a gaseous or vaporized form] the gas, vapor, suspension in a gas or volatile organic compound.

12. (Amended) A method according to claim [8] 1 wherein [the gas sensing means comprises] at least one member of the group consisting of a semiconductor gas sensing device, a conductive polymer gas sensing device, a surface acoustic wave gas sensing device, a microbar sensing device, a micromechanical probe, a quartz crystal microbalance, and an optical sensor is used in the detecting step.

13. (Amended) A method according to claim [8] 1 wherein [the gas sensing means comprises] at least a metal oxide semiconductor gas sensing device is used in the detecting step.

15. (Amended) A method according to claim [13] 1, wherein [a part] the electronic device is a circuit board or a multichip module.

16. (Amended) A method according to claim [13] 1, wherein the contaminant is at least one member of the group consisting of anions, organic acids, organics, and particulates.

17. (Amended) A method according to claim [13] 1, further comprising the step of using the information in a feedback loop to control the process.

43. (Amended) An apparatus for probing at least the quality of a material used in electronics or optics, comprising:

a multivariate detector having at least one of a sensing probe, sensing location, or physicochemical property,

the multivariate detector capable of detecting [an analytes that is] at least one analyte [member] selected from the group consisting of the material, a constituent of the material, a byproduct of the material, and a reaction product of a constituent of the material, a contaminant and a tag;

transmission means[, capable of] for transmitting a signal between the multivariate detector and a data acquisition system, the data acquisition system capable of converting the signal into raw data;

a computational device capable of processing at least part of the raw data using multivariate analysis to create a data set; and

an output device capable of displaying, storing, or using the data set.